Speckle Observations of SIM Candidate Grid Stars with the WIYN Telescope

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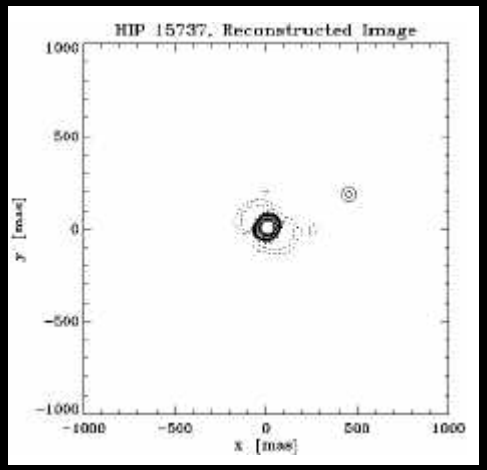
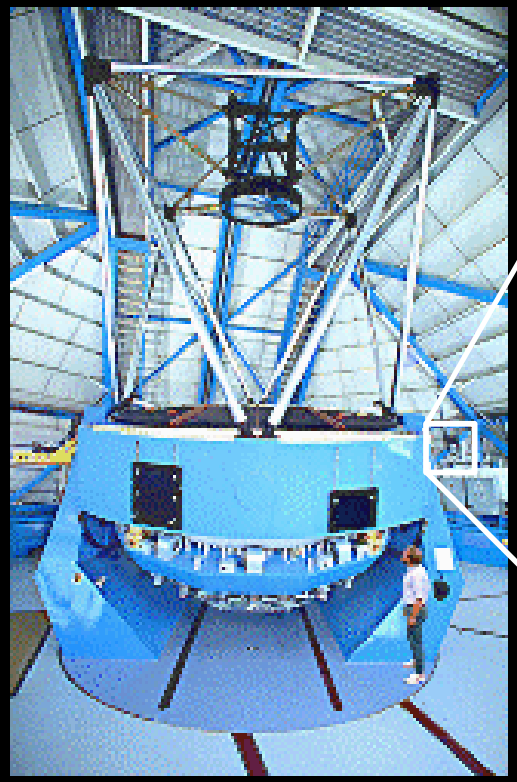
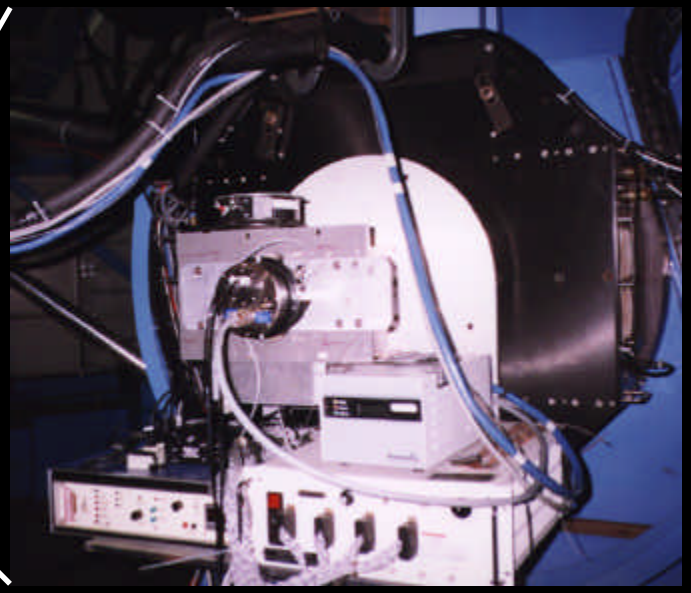


Speckle Imaging at RIT

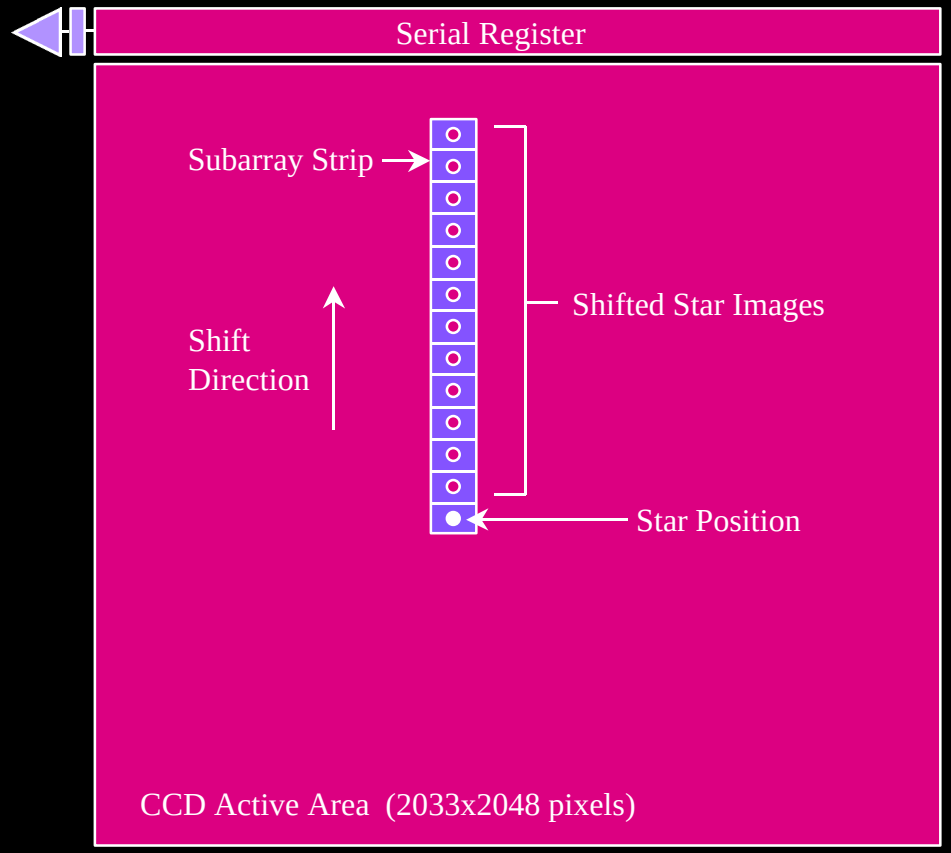
- Began 1996
- Use large format CCDs (Photometrics, ~10e- read noise, 200kHz, 500kHz, low dark current).
- Initial simulations indicated that at small telescopes our CCD was fast enough to record speckle patterns
  - small telescope → bigger speckles, fewer pixels/frame
  - Tyler & Matson 1993

Inside the WIYN Dome

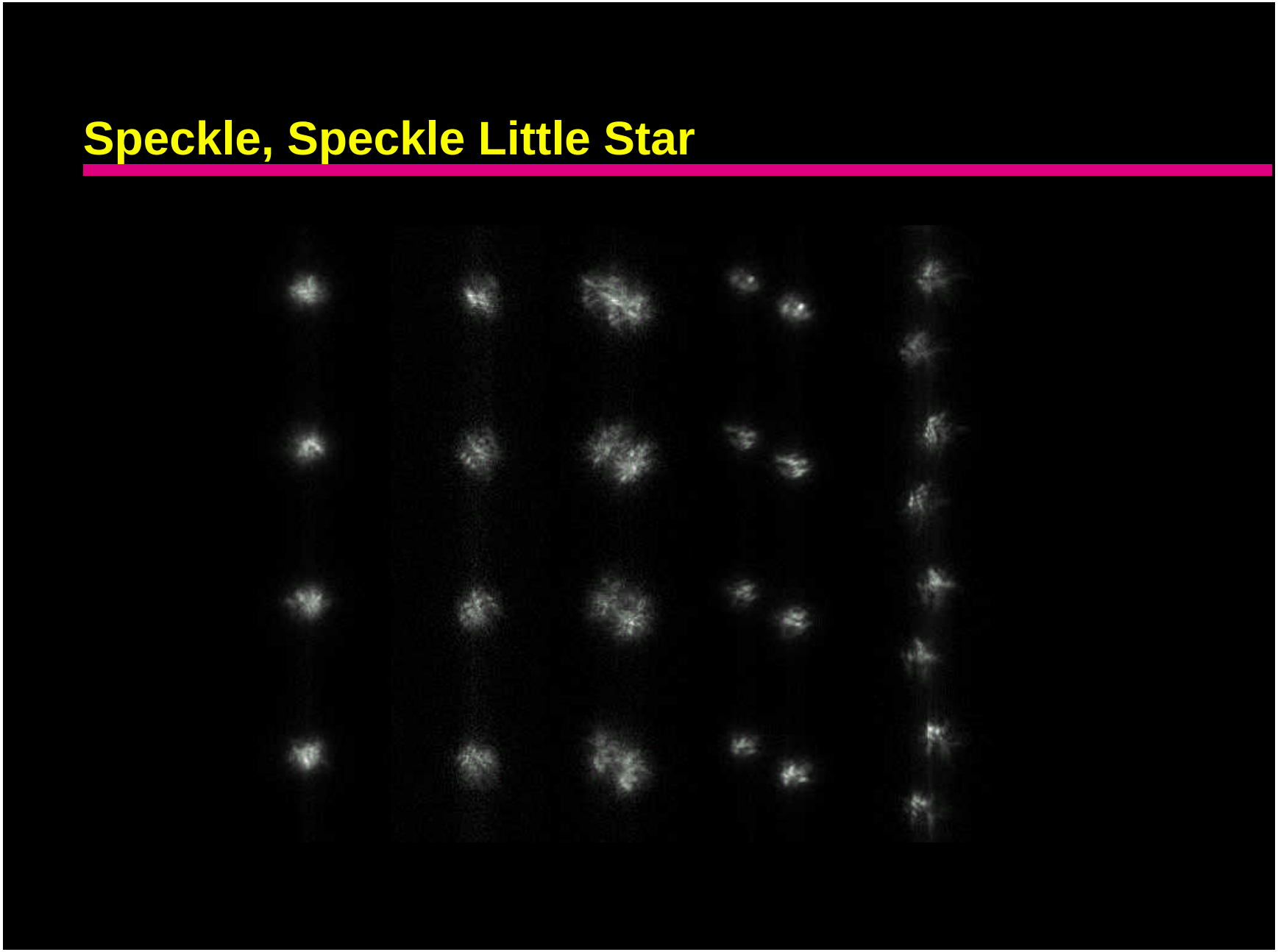




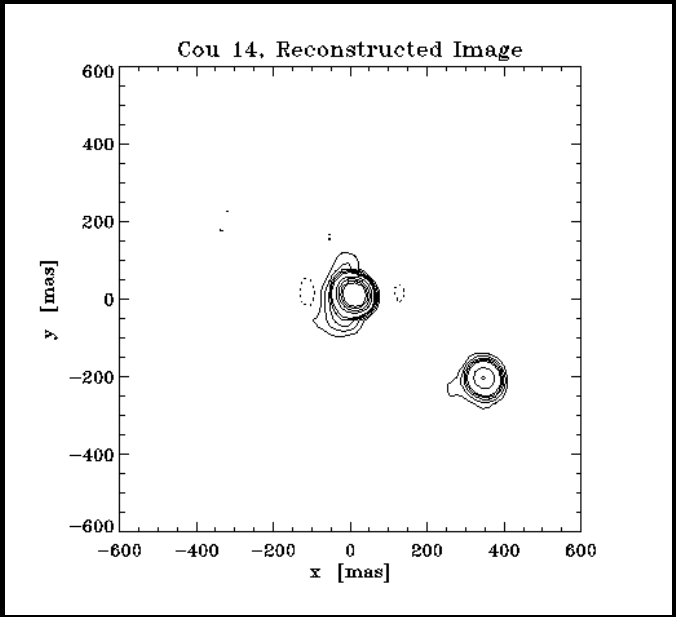
Speckle Strip Readout Method



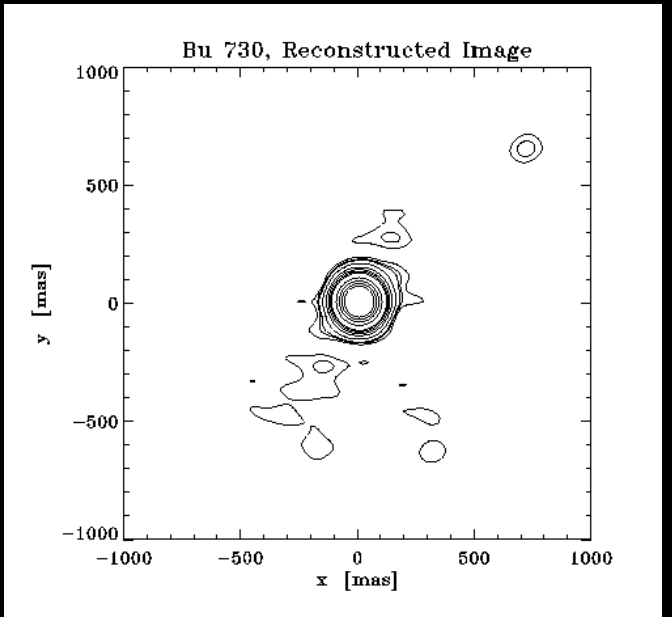
Speckle, Speckle Little Star



Reconstructed Images



$\Delta m = 2.0$

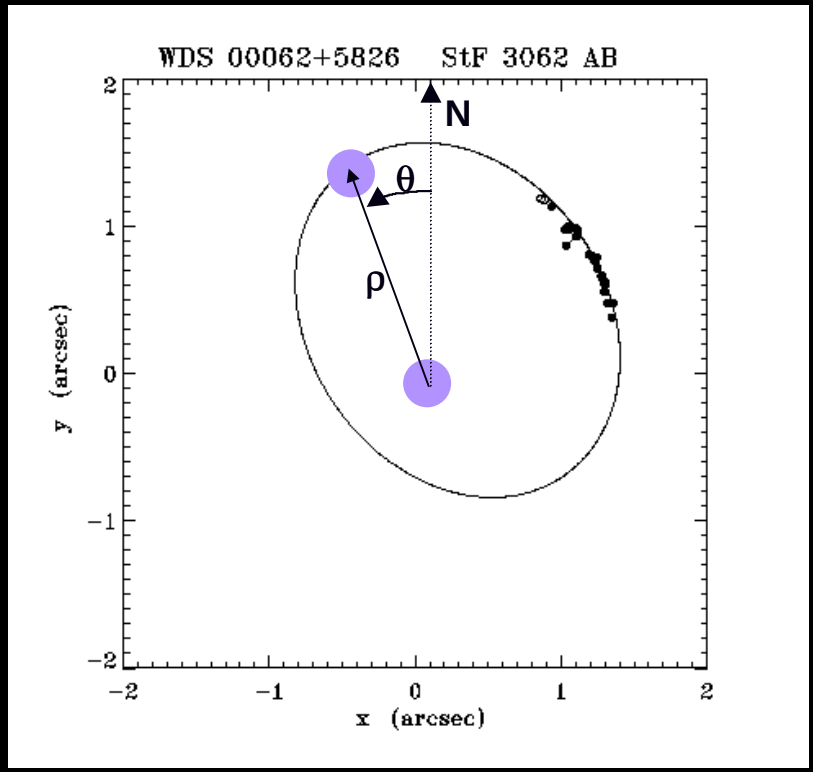


$\Delta m = 5.3$

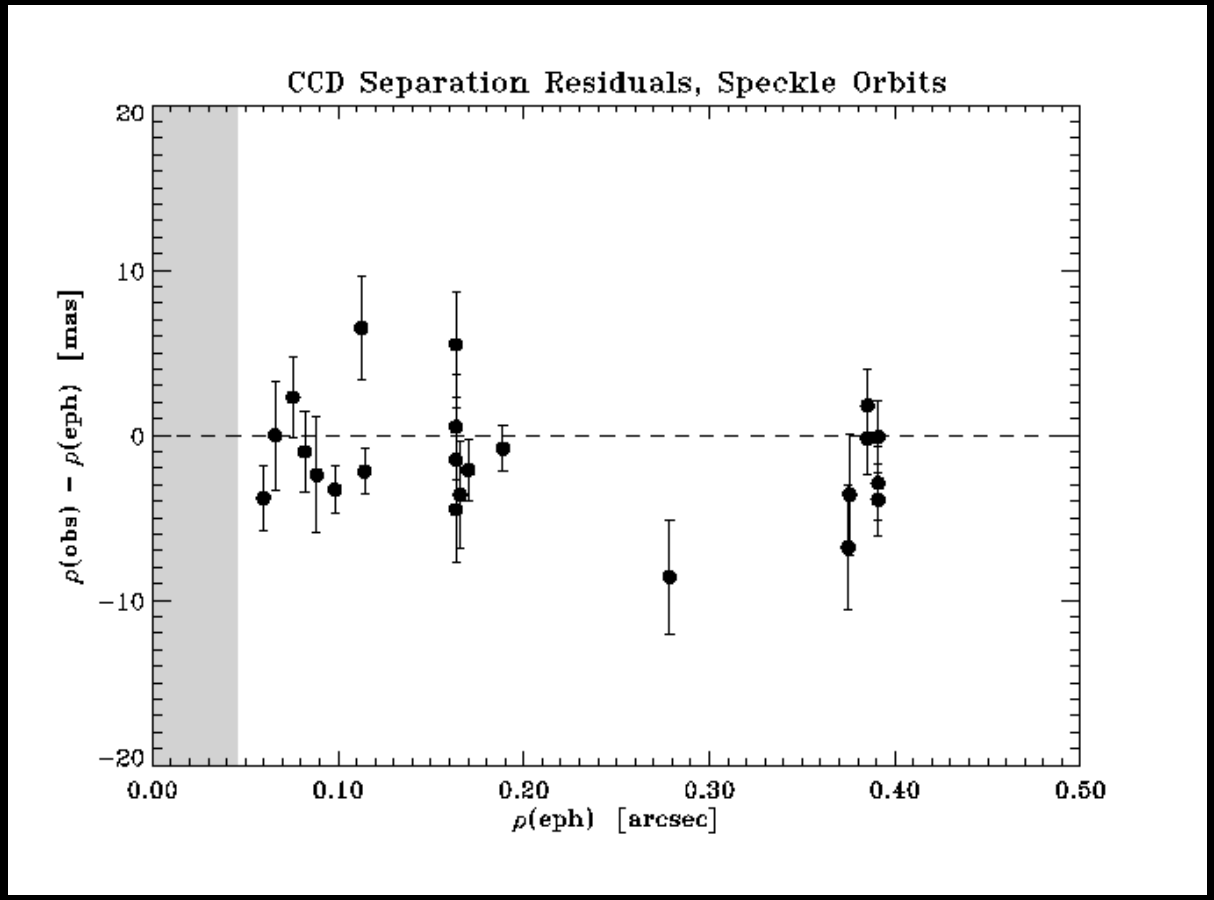
WIYN Measurement Precision Study

- **Idea: Select binaries with "good-quality" speckle orbits, measure position angles and separations with our technique, compare with orbit predictions.**

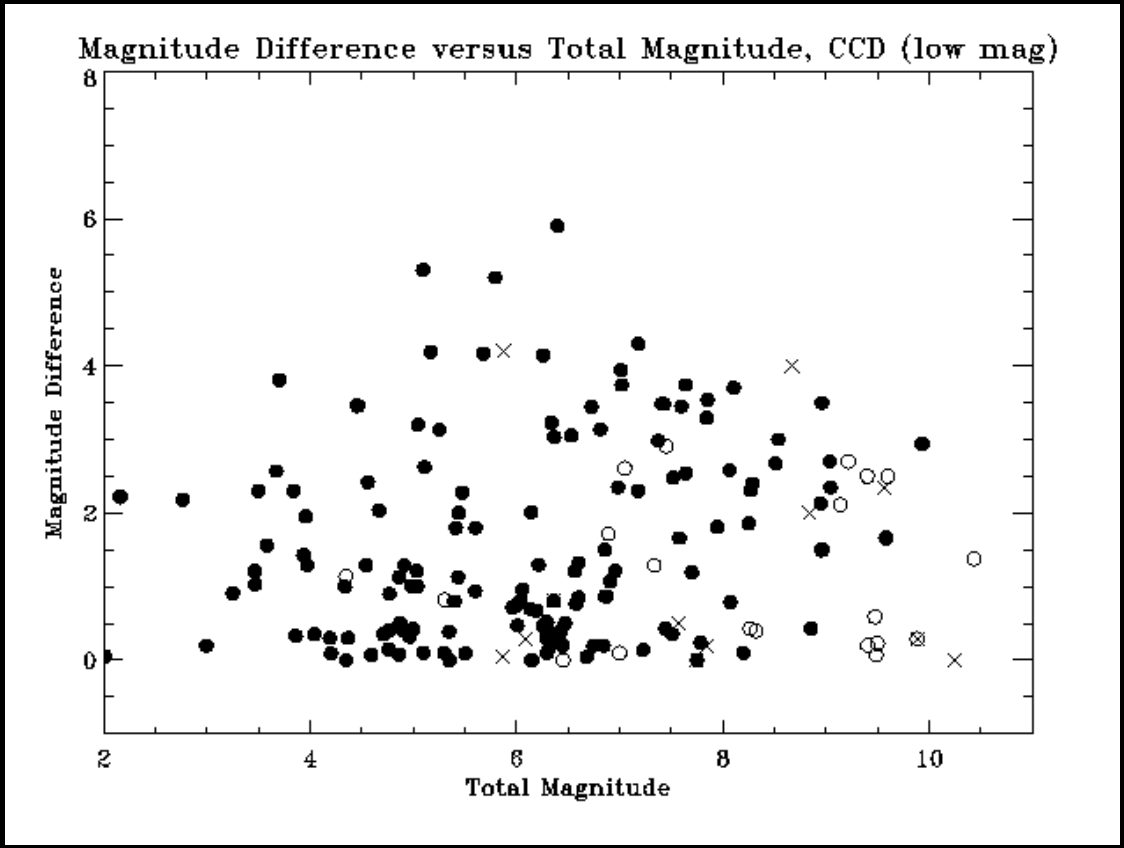
- **This study includes observations of such binaries, taken with the RIT CCD during 1997 at WIYN.**



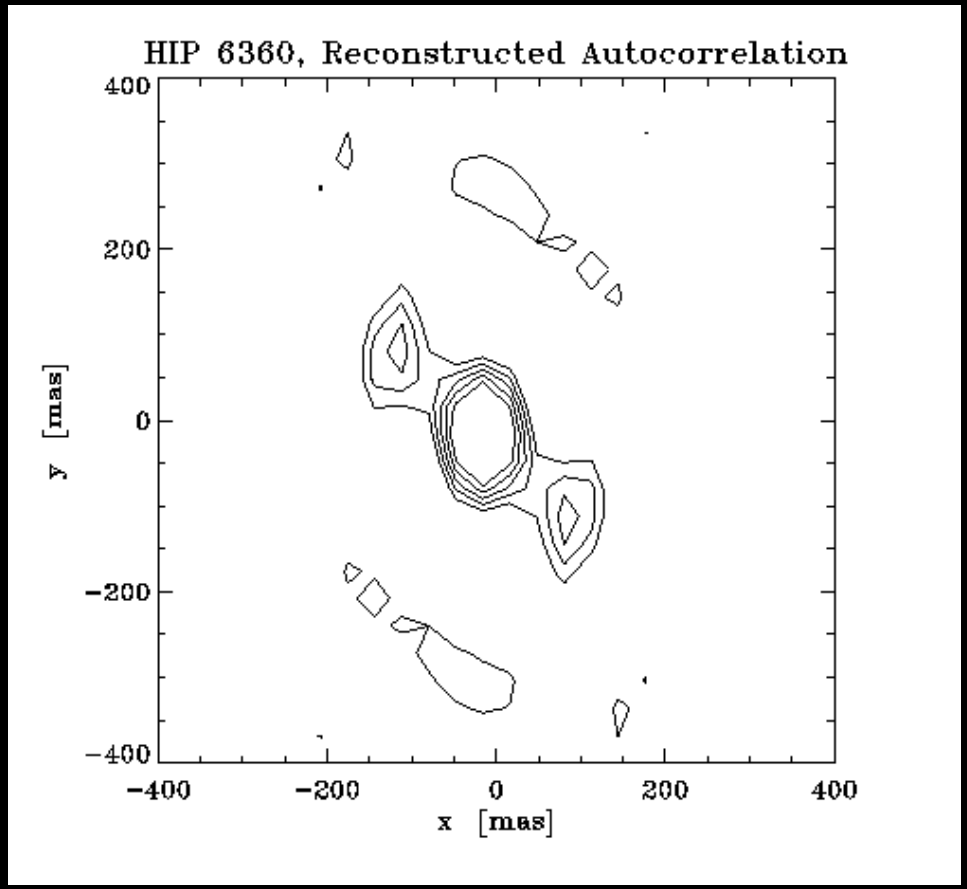
Separation Residuals at WIYN



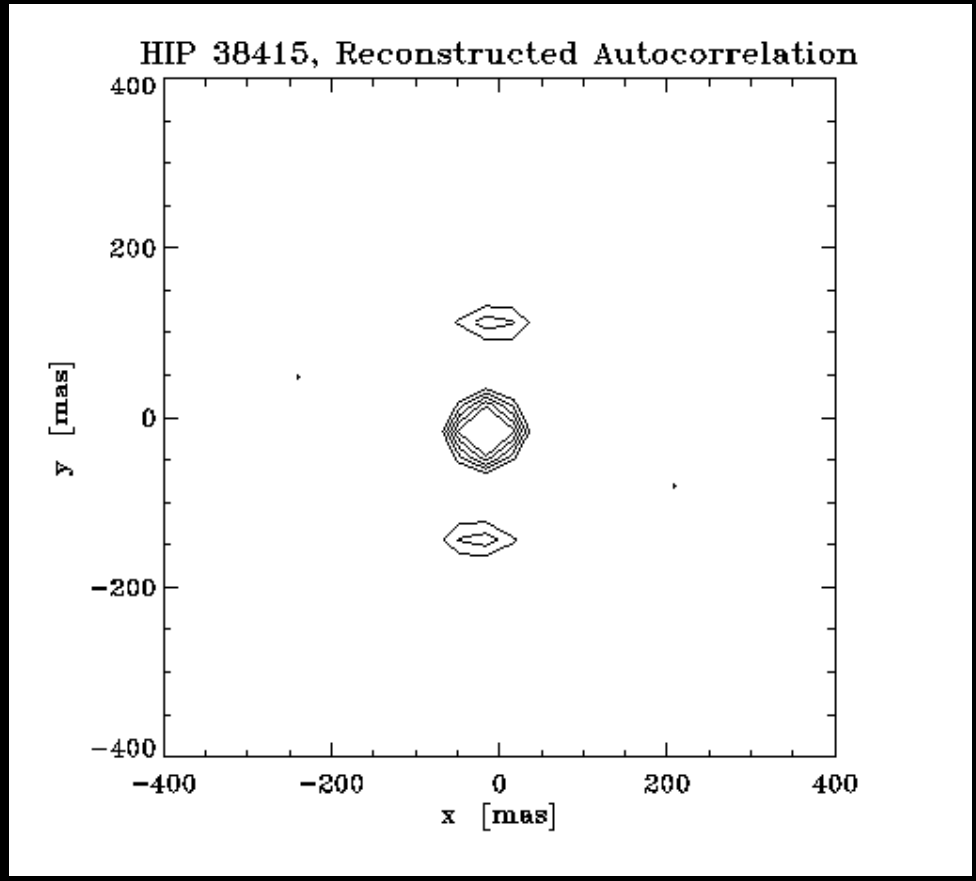
Detectability of Faint Companions at WIYN



Companion to a SIM Candidate Grid Star Discovered!



Another SIM Double Discovered!



Status and Future Plans

- ~330 Grid Candidates observed from USNO list to date.
- ~100 analyzed, 2 are double, and a few others will be classified as “suspected double.”
- Observations are ongoing: next run is 20-24 Feb 2000. (Time will be shared with MOS users.)
- 10-15 nights per year (including time shares and monsoon).